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Route establishment process for use in ad-hoc network telecommunications, e.g. Bluetooth, couples reactive routing with piconet forming to enable a source node to obtain the route to a destination node

Patent Assignee: JOHANSSON P; LARSSON T; SORENSEN J; TELEFONAKTIEBOLAGET ERICSSON L M

Inventors: JOHANSSON P; JOHANSSON P X; LARSSON T; SOERENSEN J; SORENSEN J

Patent Family (7 patents, 93 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update	Type
WO 2001041377	A1	20010607	WO 2000SE2408	A	20001201	200143	B
AU 200120357	A	20010612	AU 200120357	A	20001201	200154	E
EP 1236315	A1	20020904	EP 2000983626	A	20001201	200266	E
			WO 2000SE2408	A	20001201		
JP 2003516033	W	20030507	WO 2000SE2408	A	20001201	200331	E
			JP 2001541191	A	20001201		
CN 1408162	A	20030402	CN 2000816770	A	20001201	200345	E
US 6751200	B1	20040615	US 1999168742	P	19991206	200439	E
			US 2000696242	A	20001026		
US 20040196784	A1	20041007	US 1999168742	P	19991206	200466	E
			US 2000696242	A	20001026		
			US 2004826317	A	20040419		

Priority Application Number (Number Kind Date): US 1999168742 P 19991206; US 2000696242 A 20001026; US 2004826317 A 20040419

Patent Details

Patent Number	Kind	Language	Pages	Drawings	Filing Notes
WO 2001041377	A1	EN	30	7	
National Designated States, Original	AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG UZ VN YU ZA ZW				
Regional	AT BE CH CY DE DK EA ES FI FR GB GH GM GR				

Designated States,Original	IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW									
AU 200120357	A	EN								Based on OPI patent WO 2001041377
<u>EP 1236315</u>	A1	EN								PCT Application WO 2000SE2408
										Based on OPI patent WO 2001041377
Regional Designated States,Original	AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR									
JP 2003516033	W	JA	32							PCT Application WO 2000SE2408
										Based on OPI patent WO 2001041377
<u>US 6751200</u>	B1	EN								Related to Provisional US 1999168742
<u>US 20040196784</u>	A1	EN								Related to Provisional US 1999168742
										Continuation of application US 2000696242
										Continuation of patent US 6751200

Alerting Abstract: WO A1

NOVELTY - If the source is a member of an existing piconet (605) it broadcasts a route request message, if a timely replied is received (615) it will either use the supplied route (620,625) or it may decide to define a more efficient route when it will start to use supplied route but also initiate a parallel process to establish new routes (630,635). If it is not a member of a piconet or does not receive a timely reply to the route request, it initiates a process to establish new routes (635).

USE - For use in ad-hoc telecommunications networks such as Bluetooth.

ADVANTAGE - The process allows the source to make use of existing routes where available, whilst the ability to generate new routes enables improvements to existing routes if available and generation of new routes where none exist.

DESCRIPTION OF DRAWINGS - The figure illustrates a technique for accomplishing route discovery.

International Classification (Main): H04L-012/56

International Patent Classification

IPC	Level	Value	Position	Status	Version
H04L-0012/46	A	I	L	R	20060101
H04L-0012/56	A	I		R	20060101
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H04L-0012/56	C	I		R	20060101

US Classification, Issued: 370-228000, 370-255000

US Classification, Issued: 370-248000, 370-449000

US Classification, Issued: 370228, 370248, 370255, 370449

Original Publication Data by Authority

Australia

Publication Number: AU 200120357 A (Update 200154 E)

Publication Date: 20010612

Assignee: TELEFONAKTIEBOLAGET ERICSSON L M; SE (TELF)

Language: EN

Application: AU 200120357 A 20001201 (Local application)

Priority: US 1999168742 P 19991206

Related Publication: WO 2001041377 A (Based on OPI patent)

Current IPC: H04L-12/46(R,I,M,JP,20060101,20051220,A,L) H04L-

12/46(R,I,M,JP,20060101,20051220,C,L) H04L-12/56(R,I,M,EP,20060101,20051008,A) H04L-12/56(R,I,M,EP,20060101,20051008,C)

Current ECLA class: H04L-12/56B H04L-12/56C1

Current ECLA ICO class: T04L-12:56W6 T04L-12:56W7 T04W-40:28 T04W-40:34 T04W-84:18

China

Publication Number: CN 1408162 A (Update 200345 E)

Publication Date: 20030402

Assignee: TELEFONAKTIEBOLAGET ERICSSON L M; SE (TELF)

Language: ZH

Application: CN 2000816770 A 20001201 (Local application)

Priority: US 1999168742 P 19991206

Current IPC: H04L-12/46(R,I,M,JP,20060101,20051220,A,L) H04L-

12/46(R,I,M,JP,20060101,20051220,C,L) H04L-12/56(R,I,M,EP,20060101,20051008,A) H04L-12/56(R,I,M,EP,20060101,20051008,C)

Current ECLA class: H04L-12/56B H04L-12/56C1

Current ECLA ICO class: T04L-12:56W6 T04L-12:56W7 T04W-40:28 T04W-40:34 T04W-84:18

European Patent Office

Publication Number: EP 1236315 A1 (Update 200266 E)

Publication Date: 20020904

****LEITWEGSENTDECKUNG BASIEREND PICONETZ-BILDUNG ROUTE DISCOVERY BASED PICONET FORMING FORMATION DE PICORESEAU BASEE SUR LA RECHERCHE DE VOIES D'ACHEMINEMENT****

Assignee: Telefonaktiebolaget L M Ericsson (Publ), 126 25 Stockholm, SE

Inventor: LARSSON, Tony, Kungsholms Strand 139, 3 tr., S-112 48 Stockholm, SE JOHANSSON, Per, X., Dymlingsgrand 10, S-129 30 Hagersten, SE SORENSEN, Johan, Ostra Stro 25 Holma, S-241 91 Eslov, SE

Agent: Hammar, Ernst, Albihs Stockholm AB, P.O.Box 5581, 114 85 Stockholm, SE

Language: EN

Application: EP 2000983626 A 20001201 (Local application) WO 2000SE2408 A 20001201 (PCT Application)

Priority: US 1999168742 P 19991206

Related Publication: WO 2001041377 A (Based on OPI patent)

Designated States: (Regional Original) AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR

Current IPC: H04L-12/46(R,I,M,JP,20060101,20051220,A,L) H04L-12/46(R,I,M,JP,20060101,20051220,C,L) H04L-12/56(R,I,M,EP,20060101,20051008,A) H04L-12/56(R,I,M,EP,20060101,20051008,C)

Current ECLA class: H04L-12/56B H04L-12/56C1

Current ECLA ICO class: T04L-12:56W6 T04L-12:56W7 T04W-40:28 T04W-40:34 T04W-84:18

Original Abstract: A method for establishing a route over which data packets are to be sent from a source node to a destination node in an ad-hoc network is provided. A source having packets to send to a destination node employs a reactive routing protocol if it does not possess the route to the destination node. Initially, it may be determined whether or not the source node is a member of an existing piconet. If the source node is a member of an existing piconet, a ROUTE request message may be broadcast to the nodes of the existing piconet, while the source awaits a timely REPLY message. If the source node is not a member of an existing piconet, or if a time REPLY message is not received, the source node may initiate a new route discovery process wherein the nodes attempt to establish new piconets that enable more efficient communication between the source and destination nodes.

Japan

Publication Number: JP 2003516033 W (Update 200331 E)

Publication Date: 20030507

Language: JA (32 pages)

Application: WO 2000SE2408 A 20001201 (PCT Application) JP 2001541191 A 20001201 (Local application)

Priority: US 1999168742 P 19991206

Related Publication: WO 2001041377 A (Based on OPI patent)

Original IPC: H04L-12/56(A) H04L-12/46(B)

Current IPC: H04L-12/56(A) H04L-12/46(B)

Current ECLA class: H04L-12/56B H04L-12/56C1

Current ECLA ICO class: T04L-12:56W6 T04L-12:56W7 T04W-40:28 T04W-40:34 T04W-84:18

Current JP FI-Terms: H04L-12/56 D(main, A) H04L-12/46 W(secondary, B) H04L-12/46 200 W H04L-12/56 100 D

Current JP F-Terms: 5K030 5K033 5K033CB01 5K033CB06 5K033CB13 5K033DA05 5K033DA19
5K030HA08 5K030HC14 5K030HD07 5K030JL01 5K030LB05 5K030LD02

United States

Publication Number: US 20040196784 A1 (Update 200466 E)

Publication Date: 20041007

****Route discovery based piconet forming****

Assignee: Larsson, Tony, Stockholm, SE (LARS-I) Johansson, Per, Hagersten, SE (JOHA-I) Sorensen, Johan, Eslov, SE (SORE-I)

Inventor: Larsson, Tony, Stockholm, SE Johansson, Per, Hagersten, SE Sorensen, Johan, Eslov, SE

Agent: BURNS DOANE SWECKER MATHIS L L P, POST OFFICE BOX 1404, ALEXANDRIA, VA, US

Language: EN

Application: US 1999168742 P 19991206 (Related to Provisional) US 2000696242 A 20001026

(Continuation of application) US 2004826317 A 20040419 (Local application)

Related Publication: US 6751200 A (Continuation of patent)

Original IPC: H04L-12/26(A)

Current IPC: H04L-12/56(R,A,I,M,EP,20060101,20051008,A) H04L-12/56(R,I,M,EP,20060101,20051008,C)

Current ECLA class: H04L-12/56B H04L-12/56C1 H04W-40/24D

Current ECLA ICO class: T04L-12:56W6 T04L-12:56W7 T04W-40:24D T04W-40:28 T04W-84:18

Current US Class (main): 370-228000

Current US Class (secondary): 370-248000

Original US Class (main): 370228

Original US Class (secondary): 370248

Original Abstract: A method for establishing a route over which data packets are to be sent from a source node to a destination node in an ad-hoc network is provided. A source having packets to send to a destination node employs a reactive routing protocol if it does not possess the route to the destination node. Initially, it may be determined whether or not the source node is a member of an existing piconet. If the source node is a member of an existing piconet, a ROUTE request message may be broadcast to the nodes of the existing piconet, while the source awaits a timely REPLY message. If the source node is not a member of an existing piconet, or if a time REPLY message is not received, the source node may initiate a new route discovery process wherein the nodes attempt to establish new piconets that enable more efficient communication between the source and destination nodes.

Claim: What is claimed is: 1. ****1****. In an ad-hoc network wherein data packets are sent from a source node to a destination node via an established route, a source node comprising: * logic configured to request route discovery between the source node and a destination node; * logic configured to determine whether said request for route discovery between the source node and the destination node over existing network connections fails; and * logic configured to establish a route between the source node and the destination node by forming one or more new connections if it is determined that said request for route discovery between the source node and the destination node over existing network connections fails. |U S 6751200 B1 (Update 200439 E)

Publication Date: 20040615

****Route discovery based piconet forming****

Assignee: Telefonaktiebolaget LM Ericsson (publ), Stockholm, SE (TELF)

Inventor: Larsson, Tony, Stockholm, SE Johansson, Per, Hagersten, SE Sorensen, Johan, Eslov, SE

Agent: Burns, Doane, Swecker Mathis, L.L.P., US

Language: EN

Application: US 1999168742 P 19991206 (Related to Provisional) US 2000696242 A 200010 26 (Local application)

Original IPC: H04L-12/56(A)

Current IPC: H04L- 12/56(R,A,I,M,EP,20060101,20051008,A) H04L-12/56(R,I,M,EP,20060101,20051008,C)

Current ECLA class: H04L-12/56B H04L-12/56C1 H04W-40/24D

Current ECLA ICO class: T04L-12:56W6 T04L-12:56W7 T04W-40:24D T04W-40:28 T04W-84:18

Current US Class (main): 370-255000

Current US Class (secondary): 370-449000

Original US Class (main): 370255

Original US Class (secondary): 370449

Original Abstract: A method for establishing a route over which data packets are to be sent from a source node to a destination node in an ad-hoc network is provided. A source having packets to send to a destination node employs a reactive routing protocol if it does not possess the route to the destination node. Initially, it may be determined whether or not the source node is a member of an existing piconet. If the source node is a member of an existing piconet, a ROUTE request message may be broadcast to the nodes of the existing piconet, while the source awaits a timely REPLY message. If the source node is not a member of an existing piconet, or if a time REPLY message is not received, the source node may initiate a new route discovery process wherein the nodes attempt to establish new piconets that enable more efficient communication between the source and destination nodes.

Claim: What is claimed is: 1.5. In an ad-hoc, radio telecommunications network that includes one or more existing subnetworks, a method for establishing a route between a source node and a destination node over which data packets are to be sent, said method comprising the steps of: * broadcasting a route discovery request message, for a route between the source node and the destination node over one or more connections associated with the one or more existing subnetworks, if the source node is a member of one or more of the existing subnetworks; * determining if a timely reply message is received by the source node in response to the broadcasting of the route discovery request message; and * establishing a route between the source node and the destination node over one or more new connections associated with one or more newly formed subnetworks, if it is determined that a timely reply message was not received.

WIPO

Publication Number: WO 2001041377 A1 (Update 200143 B)

Publication Date: 20010607

****ROUTE DISCOVERY BASED PICONET FORMING FORMATION DE PICORESEAU BASEE SUR LA RECHERCHE DE VOIES D'ACHEMINEMENT****

Assignee: TELEFONAKTIEBOLAGET LM ERICSSON (publ), S-126 25 Stockholm, SE Residence: SE Nationality: SE (TELF)

Inventor: LARSSON, Tony, Kungsholms Strand 139, 3 tr., S-112 48 Stockholm, SE JOHANSSON, Per, X., Dymlingsgrand 10, S-129 30 Hagersten, SE SORENSEN, Johan, Ostra Stro 25 Holma, S-241 91 Eslov, SE Agent: MILDH, Christer, Ericsson Radio Systems AB, Ericsson Research/Patent Support Unit, S-164 80 Stockholm, SE

Language: EN (30 pages, 7 drawings)

Application: WO 2000SE2408 A 20001201 (Local application)

Priority: US 1999168742 P 19991206

Designated States: (National Original) AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR

CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK
LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM
TR TT TZ UA UG UZ VN YU ZA ZW (Regional Original) AT BE CH CY DE DK EA ES FI FR GB GH GM
GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

Original IPC: H04L-12/56(A) H04L-12/28(B)

Current IPC: H04L-12/46(R,A,I,M,JP,20060101,20051220,A,L) H04L-

12/46(R,I,M,JP,20060101,20051220,C,L) H04L-12/56(R,I,M,EP,20060101,20051008,A) H04L-
12/56(R,I,M,EP,20060101,20051008,C)

Current ECLA class: H04L-12/56B H04L-12/56C1

Current ECLA ICO class: T04L-12:56W6 T04L-12:56W7 T04W-50:08

Original Abstract: A method for establishing a route over which data packets are to be sent from a source node to a destination node in an ad-hoc network is provided. A source having packets to send to a destination node employs a reactive routing protocol if it does not possess the route to the destination node. Initially, it may be determined whether or not the source node is a member of an existing piconet. If the source node is a member of an existing piconet, a ROUTE request message may be broadcast to the nodes of the existing piconet, while the source awaits a timely REPLY message. If the source node is not a member of an existing piconet, or if a time REPLY message is not received, the source node may initiate a new route discovery process wherein the nodes attempt to establish new piconets that enable more efficient communication between the source and destination nodes. L'invention concerne un procede d'etablissement d'une voie d'acheminement par laquelle des paquets de donnees sont a envoyer a partir d'un noeud de source vers un noeud de destination dans un reseau ad-oc. Une source ayant des paquets a envoyer a un noeud de destination utilise un protocole d'acheminement reactif si elle ne possede pas la voie d'acheminement vers le noeud de destination. Initialement, il peut etre determine si oui ou non le noeud de source est un membre d'un picoreseau existant. Si le noeud de source est un membre d'un picoreseau existant, un message de demande de voie d'acheminement peut etre diffuse vers les noeuds du picoreseau existant, la source attendant un message de reponse a temps. Si le noeud de source n'est pas un membre d'un picoreseau existant, ou si un message de reponse a temps n'est pas recu, le noeud de source peut entamer un nouveau processus de decouverte de voie d'acheminement dans lequel les noeuds tentent d'etablir de nouveaux picoreseaux permettant une communication plus efficace entre les noeuds de source et de destination.

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